

Title (en)
RESISTANCE REDUCTION IN TRANSISTORS HAVING EPITAXIALLY GROWN SOURCE/DRAIN REGIONS

Title (de)
WIDERSTANDSREDUZIERUNG IN TRANSISTOREN MIT EPITAXIAL GEZÜCHTETEN SOURCE/DRAIN-REGIONEN

Title (fr)
RÉDUCTION DE RÉSISTANCE DANS DES TRANSISTORS AYANT DES RÉGIONS DE SOURCE/DRAIN OBTENUES PAR CROISSANCE ÉPITAXIALE

Publication
EP 3311418 A4 20190109 (EN)

Application
EP 15895827 A 20150619

Priority
US 2015036688 W 20150619

Abstract (en)
[origin: WO2016204786A1] Techniques are disclosed for resistance reduction in p-MOS transistors having epitaxially grown boron-doped silicon germanium (SiGe:B) S/D regions. The techniques can include growing one or more interface layers between a silicon (Si) channel region of the transistor and the SiGe:B replacement S/D regions. The one or more interface layers may include: a single layer of boron-doped Si (Si:B); a single layer of SiGe:B, where the Ge content in the interface layer is less than that in the resulting SiGe:B S/D regions; a graded layer of SiGe:B, where the Ge content in the alloy starts at a low percentage (or 0%) and is increased to a higher percentage; or multiple stepped layers of SiGe:B, where the Ge content in the alloy starts at a low percentage (or 0%) and is increased to a higher percentage at each step. Inclusion of the interface layer(s) reduces resistance for on-state current flow.

IPC 8 full level
H01L 29/775 (2006.01); **H01L 21/02** (2006.01); **H01L 21/336** (2006.01); **H01L 27/088** (2006.01); **H01L 27/092** (2006.01); **H01L 29/06** (2006.01); **H01L 29/08** (2006.01); **H01L 29/423** (2006.01); **H01L 29/66** (2006.01); **H01L 29/78** (2006.01); **H01L 29/786** (2006.01)

CPC (source: CN EP KR US)
H01L 21/0245 (2013.01 - US); **H01L 21/02532** (2013.01 - US); **H01L 21/02579** (2013.01 - US); **H01L 21/30604** (2013.01 - US); **H01L 21/76224** (2013.01 - US); **H01L 21/8238** (2013.01 - KR); **H01L 27/0886** (2013.01 - KR); **H01L 29/0649** (2013.01 - US); **H01L 29/0673** (2013.01 - EP US); **H01L 29/0847** (2013.01 - EP US); **H01L 29/42392** (2013.01 - CN EP KR US); **H01L 29/66439** (2013.01 - EP US); **H01L 29/66636** (2013.01 - US); **H01L 29/66795** (2013.01 - US); **H01L 29/775** (2013.01 - CN EP KR US); **H01L 29/78** (2013.01 - CN EP US); **H01L 29/7848** (2013.01 - CN EP KR US); **H01L 29/785** (2013.01 - CN EP KR US); **H01L 29/7851** (2013.01 - US); **H01L 29/78618** (2013.01 - CN EP KR US); **H01L 29/78696** (2013.01 - CN EP KR US); **H01L 21/823814** (2013.01 - US); **H01L 21/823821** (2013.01 - US); **H01L 21/823878** (2013.01 - US); **H01L 27/0886** (2013.01 - EP US); **H01L 27/0924** (2013.01 - US); **H01L 29/165** (2013.01 - EP US); **H01L 29/167** (2013.01 - EP US); **H01L 29/66545** (2013.01 - US)

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Designated contracting state (EPC)
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